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Entertaining Knowledge.

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FOUNTAINS AND WATER BOTTLES OF THE EAST.

In the sacred Scriptures, bread and water are commonly mentioned as the chief supports of human life; and to provide a sufficient quantity of water, and to prepare it for use, and to deal it out to the thirsty, are among the principal cares of an oriental householder. To furnish travellers with water is, even in present times, reckoned of so great importance, that many of the eastern philanthropists have been at considerable expense to procure them that enjoyment. The nature of the climate, and the general aspect of the oriental regions, require numerous fountains to excite and sustain the languid powers of vegetation—and the sun, burning with intense heat in a cloudless sky, demands for the fainting inhabitants the verdure, shade, and coolness which vegetation produces. Hence fountains of living water are met with in the towns and villages, in the fields and gardens, and by the sides of the roads and of the beaten tracts on the mountains; and a cup of cold water from these wells is no contemptible present. "Fatigued with heat and thirst," says Carne, "we came to a few cottages in a palm wood, and stopped to drink of a fountain of delicious water. In a northern climate no idea can be formed of the luxury of drinking in Egypt—little appetite for food is felt—but when, after crossing the burning sands, you reach the rich line of woods on the brink of the Nile, and pluck the fresh limes, and mixing their juice with Egyptian sugar and the soft river water, drink repeated bowls of lemonade, you feel

that every other pleasure of the senses must yield to this. One then perceives the beauty and force of those similes in Scripture, where the sweetest emotions of the heart are compared to the assuaging of thirst in a thirsty land."

In Arabia, equal attention is paid, by the wealthy and benevolent, to the refreshment of the traveller. On one of the mountains of Arabia, Niebuhr found three little reservoirs, which are always kept full of fine water for the use of passengers. These reservoirs, which are about two feet and a half square, and from five to seven feet high, are round, or pointed at the top, of mason's work, having only a small opening in one of the sides, by which they pour water into them. Sometimes he found, near these places of Arab refreshment, a piece of ground shell or a little scoop of wood for lifting the water. The same attention to the comfort of travellers is manifested in Egypt, where public buildings are set apart in some of their cities, the business of whose inhabitants is to supply the passengers with water free of expense. Some of the inhabitants of Mohammedan villages in Palestine, not far from Nazareth, brought Mr. Buckingham and his party bread and water, while on horseback, without being solicited to do so; and when they halted to accept it, both compliments and blessings were mutually exchanged. "Here, as in every other part of Nubia," says Burchardt, "the thirsty traveller finds, at short distances, water jars placed by the road side under a low roof. Every village pays a small monthly stipend to some person to fill these jars in the morning and again toward evening. The same custom prevails in Upper Egypt, but on a larger scale: and there caravanseras, (a large square building with a spacious court in the middle, for the accommodation of travellers,) are often found near those wells or fountains."

In the book of Joshua, there is a very interesting account of the wily artifice by which the Gibeonites prevailed upon Joshua to make a covenant of peace with them, when he was drawing near to their country in the course of subduing the lands in which the people of Israel were to be settled. A party of Gibeonites were sent to

meet Joshua, pretending that they had come from a far distant land as ambassadors, on the behalf of their countrymen. They took old sacks upon their asses, and wine bottles old and rent and bound up. They had also old shoes and garments, and a few remains of stale and dry provisions, to give the appearance of having just finished a long journey. When they came before Joshua, they informed him that their home was far distant, and that having heard of his great victories, they had been sent to entreat that he would make a league with them.

In the East, water and other liquors are to this day carried and kept in skin bags, of which the construction is exceedingly simple, and thus we are enabled to illustrate, by the present practices of a people in our own day, one of the customs so frequently referred to in the clear and familiar language of Holy Writ.

In making the bottles here described, the hide is stripped off entire, except at the openings where the head and feet of the animal have been cut off: these openings are sowed up, except one which is left for a spout, and secured by a string removable at pleasure. While the skin is being prepared, it is filled with hot sand to stretch it to its proper size, and the hides of different animals being used, as the kid, the sheep or goat, and the ox, the bottles and bags are of various sizes, some scarcely larger than our ordinary bottles.

Our plate represents the water carrier of India, who loads his bullock with a large skinful at the well, either to accompany travellers, or to sell the water to those who live at a distance. Whenever troops or other large bodies of people proceed upon a march into the interior of the country, a number of water carriers of this description accompany them.

Bags of skin are also used in Spain, to carry wine from the vineyards to the places where it is sold, and sherry wine is very often observed to retain the flavor of the hides in which it has been transported. Such bottles as these which have now been described were of course strongest when they were new. Our Saviour says to his disciples, "No man putteth new wine into old bottles, else

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the new wine will burst the bottles and be spilled, and the bottles perish; but new wine must be put into new bottles, and both are preserved." He meant leathern bottles. There is a passage in the hundred and nineteenth Psalm, which becomes peculiarly and powerfully beautiful to the reader who clearly understands what sort of "bottles" were used in the East. The Psalmist is describing the depth of his tribulation and grief—and the comfort he derives from reflecting on the certainty of God's promises. "I am become like a bottle in the smoke, yet do I not forget thy commandments."

CALENDAR OF NATURE

MAY.

"Lo, the winter is past, the rain is over and gone.
"The flowers appear on the earth; the time of the singing of birds is come, and the voice of the turtle is heard in our land."
Song of Solomon, ii. 11, 12.

HOWEVER the festivities with which our ancestors hailed the opening of this month may have sunk into neglect, Nature has not forsaken her festivities. She still scatters flowers, and revels in dews; she still loves her leafy garniture, and the bursts of unoppressive sunshine; for, though we moderns may abandon the customs of our forefathers, and may even deny to May those joyous attributes with which they delighted to invest her; though we sometimes complain of cold winds, dull days, and frosty nights, cutting down flower and leaf, yet is May a gladsome month withal. Vegetation has made a proud progress; it has become deep, lavish, and luxuriant; and nothing can be more delightful than the tender green of the young leaves. Primroses still scatter their million of pale stars over shady banks, and among the mossy roots of hazels; and once more, amid the thickly-springing verdure of the meadow we hail the golden and spotted cowslip. In woods there is a bright azure gleam of Myosotis sylvatica, a species of forget-me-not, and of

those truly vernal flowers called by botanists Scilla nutans, by poets blue bells; and by country folk Cuckoo's stockings. The ferns are pushing forth their russet scrolls amongst the forest moss and dead leaves. In pools—and none of our indigenous plants can rival our aquatic ones in elegance and delicate beauty—are this month found the lovely water-violet (Hottonia paulustris.)

In the early part of this month if we walk into woods we shall be much struck with their peculiar beauty. Woods are never more agreeable objects than when they have only half assumed their green array. Beautiful and refreshing is the sight of the young leaves bursting forth from the grey boughs, some trees at one degree of advance, some at another. The assemblage of the giants of the wood is seen, each in its own character and figure; neither disguised nor hidden in the dense mass of foliage which obscures them in summer:—you behold the scattered and majestic trunks; the branches stretching high and wide; the dark drapery of ivy which envelopes some of them, and the crimson flush that glows in the world of living twigs above. If the contrast of grey and mossy branches, and of the delicate richness of young leaves gushing out of them in a thousand places be inexpressibly delightful to behold, that of one tree with another is not the less so. One is nearly full clothed,—another is mottled with grey and green, struggling as it were which should have the predominance, and another is still perfectly naked. The wild cherry stands like an apparition in the woods, white with its profusion of blossom, and the wilding begins to exhibit its rich and blushing countenance. The pines look dim and dusky amid the lively hues of spring. The abeles are covered with their clusters of albescent and powdery leaves and withering catkins; and beneath them the pale spathes of the arum, fully expanded and displaying their crimson clubs, presenting a sylvan and unique air. And who does not love "the wood-notes wild?" We again recognize the speech of many a little creature who, since we last heard it, has traversed seas and sojourned in places we wot not of. The landscape derives a great portion of its vernal cheer-

fulness not merely from the *songs* of birds but from their cries. Each has a variety of cries indicative of its different moods of mind, so to speak, which are heard only in spring and summer, and are both familiar and dear to a lover of Nature. Who ever heard the *weet-weet* and *pink-pink* of the chaffinch, or the *winkle-winkle* of the blackbird as it flies out of the hedge and skims along before you to a short distance, repeatedly on a summer evening about sunset,—at any other time? In spring mornings the fields are filled with a perfect clamor of bird-voices, but at noon the wood is their oratory. There the wood-pecker's laugh still rings from a distance—the solemn coo of the wood-pigeon is still deep and rich as ever—the little chill-chall sounds his two notes blithely on the top of the tallest trees; and the voice of the long-tailed titmouse, ever and anon, sounds like a sweet and clear-toned little bell. Nests are now woven to every bough and into every hollow stump.

As the month advances, our walks begin to be haunted with the richness of beauty. There are splendid evenings, clear, serene, and balmy, tempting us to continue our stroll till after sunset. We see around us fields golden with crowfoot, and cattle basking in plenty. We hear the sonorous streams chiming into the milk-pail in the nooks of crofts, and on the other side of hedges.

Towards the close of the month, the mind, which has been continually led onward by the expansion of days, leaves, and flowers, seems to repose on the fulness of nature. Every thing is clothed. The *spring* actually seems past. We are surrounded by all that beauty, sunshine and melody which mingle in our ideas of *summer*. The leafy hedges appear half buried in the lofty grass. Butterflies take their wavering flight from flower to flower; and dragonflies on the banks of rivers. Sheep-washing is begun in many places. The mowing-grass presents a mosaic of the most gorgeous and inimitable hues, or is white with waving umbels. A passing gale awakens a scene of lively animation. The massy foliage of trees swings heavily, the boughs wave with all their loads of fragrant bloom, and snowy umbelliferous plants toss on the lea like foam on the stormy ocean.

Cottage gardens are now perfect paradises; and, after gazing on their sunny quietude, their lilachs, peonies, wall-flowers, tulips, anemonies and corcoruses with their yellow tufts of flowers, now becoming as common at the doors of cottages as the rosemary and rue once were—one cannot help regretting that more of our laboring classes do not enjoy the freshness of earth, and the pure breeze of heaven, in these little rural retreats, instead of being buried in close streets. A man who can, in addition to a tolerable remuneration for the labor of his hands, enjoy a clean cottage and a garden amidst the common but precious offerings of nature; the grateful shade of trees and the flow of waters, a pure atmosphere and orient sky, can scarcely be called *poor*.

FLOWERS.

The return of May again brings over us a living sense of the loveliness and delightfulness of flowers. Of all the minor creations of God they seem to be most completely the effusions of his love of beauty, grace and joy. Of all the natural objects which surround us they are the least connected with our absolute necessities. Vegetation might proceed, the earth might be clothed with a sober green; all the processes of fructification might be perfected without being attended by the glory with which the flower is crowned; but beauty and fragrance are poured abroad over the earth in blossoms of endless varieties, radiant evidences of the boundless benevolence of the Deity. They are made solely to gladden the heart of man, for a light to his eyes, for a living inspiration of grace to his spirit, for a perpetual admiration. And accordingly, they seize on our affections the first moment that we behold them. With what eagerness do very infants grasp at flowers! As they become older they would live for ever amongst them. They bound about in the flowery meadows like young fawns; they gather all they come near; they collect heaps; they sit among them, and sort them, and sing over them, and caress them, till they perish in their grasp.

XUM

> This sweet May morning
> The children are pulling
> On every side,
> In a thousand valleys far and wide
> Fresh flowers.—WORDSWORTH.

We see them coming wearily into the towns and villages with their pinafores full, and with posies half as large as themselves. We trace them in shady lanes, in the grass of far-off fields by the treasures they have gathered and have left behind, lured on by others still brighter. As they grow up to maturity, they assume, in their eyes, new characters and beauties. Then they are strewn around them, the poetry of the earth. They become invested by a multitude of associations with innumerable spells of power over the human heart; they are to us memorials of the joys, sorrows, hopes, and triumphs of our forefathers; they are, to all nations, the emblems of youth in its loveliness and purity.

The ancient Greeks, whose souls pre-eminently sympathised with the spirit of grace and beauty in every thing, were enthusiastic in their love, and lavish in their use of flowers. They scattered them in the porticoes of their temples, they were offered on the altars of some of their deities; they were strewed in the conqueror's path; on all occasions of festivity and rejoicing they were strewn about, or worn in garlands.

> It was the custom then to bring away
> The bride from home at blushing shut of day,
> Veiled, in a chariot, heralded along
> By strewn flowers, torches, and a marriage song.
> KEATS.

The guests at banquets were crowned with them

> Garlands of every green, and every scent,
> From vales deflowered, or forest-trees branch-rent,
> In baskets of bright osiered gold were brought,
> High as the handles heaped, to suit the thought
> Of every guest, that each as he did please
> Might fancy-fit his brows, silk-pillowed at his ease.
> KEATS.

And wherever they wished to throw beauty, and to express gladness, like sunshine they cast flowers.

Something of the same spirit seems to have prevailed

amongst the Hebrews. "Let us fill ourselves," says Solomon, "with costly wine and ointments; and let no flower of the spring pass by us. Let us crown ourselves with rosebuds before they be withered." But amongst that solemn and poetical people they were commonly regarded in another and higher sense, they were the favorite symbols of the beauty and fragility of life. Man is compared to the flower of the field, and it is added, "the grass withereth, the flower fadeth." But of all the poetry ever drawn from flowers, none is so beautiful, none is so sublime, none is so imbued with that very spirit in which they were made as that of Christ. "And why take ye thought for raiment? Consider the lilies of the field, how they grow; they toil not, neither do they spin, and yet I say unto you, that even Solomon in all his glory, was not arrayed like one of these. Wherefore, if God so clothe the grass of the field, which to-day is, and to-morrow is cast into the oven, shall he not much more clothe you, O ye of little faith!" The sentiment built upon this, entire dependence on the goodness of the Creator, is one of the lights of our existence, and could only have been uttered by Christ; but we have here also the expression of the very spirit of beauty in which flowers were created; a spirit so boundless and overflowing that it delights to enliven and adorn with these riant creatures of sunshine the solitary places of the earth; to scatter them by myriads over the very desert "where no man is; on the wilderness where there is no man;" sending rain, "to satisfy the desolate and waste ground, and to cause the bud of the tender herb to spring forth."

In our confined notions, we are often led to wonder why

> "Full many a flower is born to blush unseen,
> And waste its fragrance on the desert air;"

why beauty, and flowers, and fruit should be scattered so exuberantly where there are none to enjoy them. But the thoughts of the Almighty are not as our thoughts. *He* sees them; he doubtlessly delights to behold the beauty of his handiworks, and rejoices in that tide of

glory which he has caused to flow wide through the universe. We know not, either, what spiritual eyes besides may behold them; for pleasant is the belief, that

"Myriads of spiritual creatures walk the earth.'

And how often does the gladness of uninhabited lands refresh the heart of the solitary traveller! When the distant and sea-tired voyager suddenly descries the blue mountain-tops, and the lofty crest of the palm-tree, and makes some green and pleasant island, where the verdant and blossoming forest-boughs wave in the spicy gale; where the living waters leap from the rocks, and millions of new and resplendent flowers brighten the fresh sward, what then is the joy of his heart! To Omnipotence creation costs not an effort, but to the desolate and the weary, how immense is the happiness thus prepared in the wilderness! Who does not recollect the exultation of Vaillant over a flower in the torrid wastes of Africa? A magnificent lily, which, growing on the banks of a river, filled the air far around with its delicious fragrance, and, as he observes, had been respected by all the animals of the district, and seemed defended even by its beauty. The affecting mention of the influence of a flower upon his mind in a time of suffering and despondency, in the heart of the same savage continent, by Mungo Park, is familiar to every one. In the East flowers are made to speak the language of sentiment. The custom of embellishing houses and garnishing tables with them is unquestionably eastern. Perhaps the warmer countries of Europe are less in the use of them than they were formerly. Boccaccio talks of them being disposed even in bed-chambers. Perhaps the most touching of the popular uses of flowers is that of strewing the dead with them, designating the age, sex, or other particular circumstances, by different flowers. How expressive in the hand of a fair young girl, cut off in her early spring, are a few pure and drooping snowdrops, an image exquisitely employed by Chantrey in his celebrated piece of sculpture—the two Children at Litchfield. Let the pensive lily of the valley for ever speak of the gentle maid

that has been stricken down in her May; and the fair white lily of the youth shorn in his unsullied strength; and let those who have passed through the vanities of time have

> Flowers of all hues, and with its thorn the rose.

But even this tender custom is on the decline, from a needless notion that they generate insects, and tend to destroy the body they adorn.

May is so called from the goddess Maia, a name under which the earth was worshipped at this dædal season of the year. The Saxons termed it *Trimilki*, because they began to milk their cows three times a-day in this month.

MUD AND AIR VOLCANOES.

In Italy and the equinoctial regions of America, are exhibited the phenomena of *Los Volcancitos* or *Mud Volcanoes*, in which hydrogen gas is the principal agent. The one at Sasuolo, not far from Modena, is visited by all the curious; a piece of wood plunged into that oozy volcano makes the water rise in the form of a jet. Several mud-volcanoes similar to those near Modena, are situated in the island of Sicily. Among others there is one at Valanghe della Lalomba, another at Terra Pilata, and a third at Macaluba. The first is the least important; its movements are wholly checked during very hot weather. The second consists of an eminence in which there are several fissures; from a great many small cones, gas and mud rise to the height of six or seven feet; other cones about five feet in depth emit streams of hydrogen. The volcano at Macaluba is somewhat different; it is situated on a little hill about fifty feet in height—its small craters discharge bubbles of gas, which breaking the clay that covers them, produce a noise like that occasioned by a cork bursting a bottle. A salt spring issues from the hill.

Our present illustration is a fine and spirited view of the mud volcanoes of Turbacco, near Carthagena, in South

MUD VOLCANOES OF TURBACCO.

America. They are thus described by the celebrated traveller HUMBOLDT.

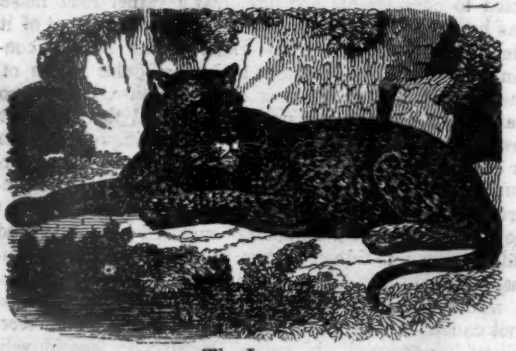
"After traversing a space of about fifty-three hundred yards, covered with the decayed trunks of trees, and in which there appeared here and there projections of a limestone rock containing petrified corals, we reach an open place of about nine hundred and eight feet square, entirely destitute of vegetation. The surface was composed of layers of clay, of a dark gray color, cracked by desiccation into pentagonal and heptagonal prisms. The volcancitos consist of fifteen or twenty small truncated cones rising in the middle of this area, and having a height of from nineteen to twenty-five feet. The most elevated were on the southern sides, and their circumference at the base was from seventy-eight to eighty-five yards. On climbing to the top of these mud-volcanoes, we found them terminated by an aperture, from sixteen to thirty inches in diameter, filled with water, through which air-bubbles obtained a passage, about five explosions usually taking place in two minutes. The force with which the air rises would lead to the supposition of its being subjected to considerable pressure, and a rather loud noise was heard at intervals, preceding the disengagement of it fifteen or eighteen seconds. Each of the bubbles contained from twelve to fourteen and a half cubic inches of elastic fluid, and their power of expansion was often so great that the water was projected beyond the crater or flowed over its brim. Some of the openings by which air escaped were situated in the plain without being surrounded by any prominence of the ground. It was observed that when the apertures, which are not placed at the summit of the cones, and are enclosed by a little mud wall from ten to fifteen inches high, are nearly contiguous, the explosions did not take place at the same time. It would appear that each crater receives the gas by distinct canals, or that these terminating in the same reservoir of compressed air, oppose greater or less impediments to the passage of the aeriform fluids. The cones have no doubt been raised by these fluids, and the dull sound that precedes the disengagement of them, indicates

that the ground is hollow. The natives asserted that there had been no observable change in the form and number of the cones for twenty years, and that the little cavities are filled with water even in the driest seasons. The temperature of this liquid was not higher than that of the atmosphere. A stick could easily be pushed into the apertures to the depth of six or seven feet, and the dark colored clay or mud was exceedingly soft. An ignited body was immediately extinguished on being immersed in the gas collected from the bubbles, which was found to be pure azote.

NATURAL HISTORY.

THE JAGUAR

This animal, sometimes called the American Tiger, is one of the most formidable animals of the New World. He is to be found in the southern division of America, from Paraguay to Guiana; but he does not appear to in-



The Jaguar.

habit to the northward of the isthmus of Darien. Even in the south the race is gradually growing more rare, in consequence of the double temptation to destroy him, which

is offered by the desire of getting rid of a beast so destructive to the flocks, and by the high price which is obtained for his skin.

"More robust and more clumsy than the leopard, he is also much superior in size, as he often measures four or five feet from the nose to the root of the tail. His head is larger and rounder than the leopard's, his limbs are shorter, and his tail is of such a length as only to allow the tip to trail on the ground when the animal stands erect. Above the line of the eyes, the profile is also more prominent. 'These differences of form (says Mr. Bennet) are accompanied by differences in color and markings equally decisive. The general appearance is at the first glance the same in both; but the open roses of the leopard are scarcely more than half the size of those of the Jaguar, and they all inclose a space of one uniform color; in which, unless in some rare and accidental instances, no central spots exist, while in the latter animal most of those which are arranged along the upper surface near the middle line of the back are distinguished by one or two small black spots enclosed within their circuit. The middle line itself is occupied in the leopard by open roses intermixed with a few black spots of small size and roundish form; that of the Jaguar, on the contrary, is marked by one or two regular longitudinal lines of broad, elongated, deep black patches, sometimes extending several inches in length, and occasionally forming an almost continuous band from between the shoulders to the tail. The black rings towards the tip of the latter are also more completely circular in the leopard.

The Jaguar is a solitary animal, residing in forests, especially near large rivers. He is an excellent swimmer. D'Azara tells us, partly from personal observation, that after a Jaguar had destroyed a horse, he dragged the body sixty paces, and then swam with it over a broad and deep river. He is equally expert at climbing. "I have seen (says M. Sonini) in the forests of Guiana, the prints left by the claws of the Jaguar on the smooth bark of a tree from forty to fifty feet in height, measuring about a foot and a half in circumference, and clothed with branches

near its summit alone. It was easy to follow with the eye the efforts which the animal had made to reach the branches: although his talons had been thrust deeply into the body of the tree, he had met with several slips, but he had always recovered his ground, and, attracted no doubt by some favorite object of prey, had at length succeeded by gaining the very top."

"The Jaguar lies in ambush for his prey, on which he pounces suddenly, and his great muscular strength enables him instantly to bear it to the ground. Man he does not often attack, and never but by stealth. While M. Somini was travelling in Guiana, his party was closely dogged for three nights by one of these animals, which eluded all their attempts to shoot it, and would doubtless have carried off any individual who might have unguardedly exposed himself.

"Ferocious as he is in his wild state, the Jaguar, when captive, becomes tame and even mild, and is particularly fond of licking the hands of those familiar with him."

SINGULAR ENCOUNTER WITH A LIONESS.

This is a representation of an occurrence which took place in the tower of London, and is strikingly illustrative, not only of the courage of the individual concerned, but also of the native superiority of the moral courage of man to the strength and ferocity of the inferior animals. The tale is well told in an elegant publication entitled "The Tower Menagerie."

"It cannot be doubted that the lighter and slenderer shape of the lioness, and her consequently greater activity, tend, in an especial manner, to the formation of that lively and sensitive character by which all her actions are so strongly marked; but there is another cause, no less powerful than these, which operates with peculiar force, in the vivid excitability of her maternal feelings, which she cherishes with an ardor almost unparalleled in the history of any other animal. From the moment she becomes a mother, the native ferocity of her disposition is

renovated, as it were, with tenfold vigor; she watches over her young with that undefined dread of danger to their weak and defenceless state, and that suspicious eagerness of alarm, which keeps her in a constant state of feverish excitation; and wo be to the wretched intruder, whether man or beast, who should unwarily, at such a time, approach the precincts of her sanctuary! Even in a state of captivity, she may have been previously subjected to the control of her keeper: she now loses all respect for his commands, and abandons herself occasionally to the most violent paroxysms of rage.

"Of this, the individual lioness now in the Tower of London, affords a striking example. For a considerable time after her arrival in England, she was so tame as to be allowed frequently to roam at large about the open yard; and even long after it had been judged expedient that this degree of liberty should no longer be granted, her disposition was far from exciting any particular fear in the minds of her keepers. As an instance of this, we may mention that when on one occasion, about a year and a half ago, she had been suffered through inadvertence to leave her den, and when she was by no means in a good temper, George Willoughway, the under keeper, had the

boldness alone, and armed only with a stick, to venture upon the task of driving her back into her place of confinement; which he finally accomplished, not, however, without strong symptoms of resistance on her part, as she actually made three springs upon him, all of which he was fortunate enough to avoid.

MINERAL KINGDOM.

LEAD.

LEAD is a meta very anciently known; it is often mentioned by Moses. Its alchemical name was *Saturnus*. It is of a considerably blue tinge, very soft and flexible, not very tenacious, and consequently incapable of being drawn into fine wire, though it is easily extended into thin plates under the hammer—when recently cut it has a strong metallic lustre, but it soon tarnishes from exposure to the air. It soils paper and the fingers, imparts a slight taste, and emits, by friction, a peculiar smell. Its specific gravity is 11.358. It is a good conductor of heat, melts at 612° Fahr. and, when cooled, slowly crystallizes in quadrangular pyramids. It is brittle at the time of congelation. In this state it may be broken to pieces with a hammer, and the crystallization of its internal parts will exhibit an arrangement in parallel lines. Most of the acids attack lead. The sulphuric does not act upon it, unless it be concentrated and boiling. Nitric acid acts strongly on lead. Muriatic acid acts directly on lead by heat, oxidizing it, and dissolving part of its oxide. *White lead*, or *ceruse*, is made by rolling leaden plates spirally up, so as to leave a space of about an inch between each coil, and placing them vertically in earthen pots, at the bottom of which is some good vinegar. This, like all the preparations of lead, is a deadly poison. Lead may be mixed with gold and silver, in a moderate heat, but when the heat is much increased, the lead rises to the surface, combined with all heterogeneous matters. Upon this property of lead is built the art of refining the precious metals. If melted lead be exposed to the atmosphere, a greyish-yellow powder begins to form upon the surface, called *common massicot;* and by a higher heat, and longer exposure to the air, it assumes a deeper yellow, and is then called *massicot*, or YELLOW OXYD OF LEAD. By a second exposure this oxyd appears capable of combining with more oxygen. It gradually changes color and ulti-

mately assumes a splendid red. In this state it is called *minium*, or RED LEAD. If the heat be too great or rapid the lead becomes converted into a flaky substance, called *litharge*. The common *sugar of lead* is an *acetate*, and Goulard's extract, made by boiling litharge in vinegar, is a *subacetate*. The power of this salt as a coagulator of mucus, is superior to that of the other. If a plate of zinc be suspended by a thread, in a solution of acetate of lead, the lead will be revived, and form an *arbor saturni*. The acetate or sugar of lead, is usually crystallized in needles, which have a silky appearance. The proper counterpoison of a dangerous dose of sugar of lead, is a solution of Epsom or Glauber salts, liberally swallowed; either of which medicines instantly converts the poisonous acetate of lead into the inert sulphate. Sugar has been found to neutralize the poisonous action of acetate of lead, and therefore may be regarded as an excellent antidote to it.

ORES OF LEAD.

Ores of lead occur in great abundance in a most every part of the world. They are generally in veins, sometimes in siliceous rocks, sometimes in calcareous rocks. Nearly all the lead of commerce is obtained from *galena*, the *sulphuret of lead*, which is found both in masses and crystallized. There exists however, but a single ore of lead, which ever occurs in sufficient quantity by itself to justify its exploration—that ore is the *sulphuret*. It constitutes beds and veins, both of which are sometimes very extensive. In England it is very abundant. It is widely dispersed over the United States. The mines of Missouri and of the Northwestern Territory, are very rich. The deposite of galena in which the mines of Missouri are situated, is evidently one of the most extensive and important hitherto discovered. *Carbonate of lead*, or *white lead ore*, so called from its prevailing color, like all the salts of lead, is perfectly unmetallic in its appearance, and is not unfrequently rejected from among common lead ore, as an earthy mineral. This species often occurs massive, and intermingled with earth and metallic oxides, and is sometimes tarnished and blackened, so as to be

with difficulty recognised. It is pretty abundant in European countries, but has been found very sparingly in the United States. *Sulphate of lead* occurs, but not very plentifully, in the Hartz, Spain, England, and Scotland. *Chromate of lead* is of a deep orange-red color; when pulverized, orange-yellow. It has hitherto been found only in Siberia, where it occurs in a vein traversing gneiss and mica slate in the gold mine of Beresof. *Molybdate of lead* occurs principally at Bleiberg in Carinthia, with other ores of lead. It has also been found in very small quantity, at South Hampton, Massachusetts. *Phosphate of lead* is found accompanying the common ores of lead, though rarely in any considerable quantity. Finely crystallized varieties are found at Przibram in Bohemia, at Huelgoet in Brittany, at Lead-hills in Scotland, and at Cornwall in England. In the United States it occurs at the lead mine near Freyburg in Maine. Such are the ores of lead, all of which, with the exception of the chromate, are more or less employed in furnishing the lead of commerce, but the salts, as has been remarked above, in very limited quantity compared with the sulphuret. England produces about half the lead of Europe; the Hartz, Austria, Prussia, and their dependencies nearly all the remainder. The lead mine of Galena, in Illinois, yielded in 1829, about six thousand tons of lead. The annual product of all the lead mines of Great Britain is about forty-six thousand tons.

It is certain that both lead and tin were employed, in extremely remote ages, in the fabrication of arms, and above all, in the ornamental parts of them. Homer alludes to the practice of putting leaden balls at the end of fishing lines. The custom of writing on lead mounts also into very great antiquity. Frontinus and Dio Cassius assure us that the consul Hirtius, besieged in Modena, wrote upon a leaf of lead, respecting his situation to Decius Brutus, who replied by the same means. Pausanias speaks of certain books of Hesiod written upon sheets of lead, and Mountfaucon assures us, that in 1699 he bought at Rome, a book entirely of lead, four inches long by three inches wide. From Job xix. 24, it appears to have been usual

in his day to write or engrave upon plates of lead. According to Pliny, even public acts were consigned to volumes or leaves of the same material. The poets make frequent allusion to leaden coins. Statues of lead are very rare.

FAMILIAR ILLUSTRATIONS OF NATURAL PHENOMENA.

THE GREAT CURRENT OF THE ATLANTIC, CALLED THE GULF STREAM.

PERSONS are often prevented from inquiring into a subject, under the impression that it is too difficult for them to comprehend; when a very little attention would render it very easy.

Every body, who has observed the stream rushing through a mill-dam into a wide basin of water, must have noticed, that a great part of the water is in a state of constant circulation. If a chip of wood is thrown into the current, it is carried away at first very rapidly, but afterwards gets to the edge of the stream, takes a circuit, and is possibly brought back nearly to the place where it was first thrown in. This revolving motion of the water is thus occasioned: the water next to that in the stream is dragged along with it; the removal of this causes a hollow, into which the water next to it runs; and this kind of motion is thus propagated throughout all the mill-pool.

Now this represents, on a small scale, a great natural phenomenon, called the Gulf Stream, because it was first observed in the Gulf of Florida, in the Atlantic Ocean. That particular current, however, is only part of an extensive circulation of all the waters in the great western basin.

To understand this, it must be observed, that the waters of the open ocean, between the tropics, have a constant motion from east to west. This is seen very evidently at the Cape of Good Hope, where the waters of the great Indian Ocean unite with the Atlantic. There is a con-

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stant current setting from east to west, so that ships require a strong westerly wind to stem it: and many fatal accidents have happened by ships being driven upon the western coast of Africa, when they thought themselves many leagues to the east of it, from not allowing for the westerly current. The motion of the waters in the free ocean, would be at the rate of ten miles in twenty-four hours.

Now, upon casting an eye upon the map of the Atlantic, it will be seen that this great stream of water, coming from the ocean round the south of the Cape of Good Hope, will run in about a northwesterly direction, until it comes upon the great dam formed by the coast of South America. The waters of the Atlantic, between the tropics, are themselves impelled by the same causes which create this current, and in the same direction, so that a vast body of water, arising from the united action of those currents, is heaped up against the shores of South America. The strength of this current falls upon that part of the coast which is to the north of the river Parabiba; and by the direction of the coast is sent on, in nearly a northwesterly direction, past the mouths of the great rivers, Amazon and Oronoco, where the waters of the current enter the Caribbean Sea. The island of Trinidad is placed here just in the heart of the stream; and the waters pour between that island and the main land with great rapidity, and then form a westerly current along the whole northern coast of South America. The effect of this current is seen in the distribution of land and water in that part of the globe. The islands of the West Indies seem to be those parts of a formerly connected continent, which have had strength enough to resist the continual force of the waves. And the Isthmus of Darien is, as it were, the back-bone of a skeleton, of which the flesh and cartilages have been eaten away.

Along this isthmus the current of the western ocean is forced in a northerly direction; it meets with the turbid waves of the Mississippi, and proceeds to the southern extremity of Florida, so that its course is now turned nearly due east. Here it passes with great rapidity into

the strait of Bahama, at the rate of *eighty miles in twenty-four hours*, or double the average rapidity of rivers, and sometimes even with a velocity of *five miles an hour*, having now taken a nearly northeasterly direction.

We began by comparing the Gulf Stream to a mill-pool. To complete the resemblance at this point, we must suppose the stream which issues from the mill to be filled with *hot water*. For the great tropical current has been detained for a long time in the great hot gulf formed by the coast of Caraccas, the Mexican and Florida coasts, and at length issues forth into the North Atlantic, at a temperature so greatly above the average heat of the ocean, that vessels navigating those seas, can tell within a few minutes the time of their entering the Gulf Stream by the sudden increase in the warmth of the water. This difference often amounts to nine, twelve, and fifteen degrees of Fahrenheit's thermometer, and sometimes to much more. Thus, on the bank of Newfoundland, the temperature of the cold water on the bank has been observed to be 50°, while that of *the stream was* 72°.

The breadth of the stream gradually increases after it leaves the straits of Bahama. Between Cape Biscaino and the bank of Bahama, the breadth is fifteen leagues. In latitude 28° 30′ N. the breadth is seventeen leagues. In latitude 41° 25′ N., longitude 67° W., it is eighty leagues wide; and having now met with a great arctic current, it is turned towards the East, at the southern extremity of the bank of Newfoundland, which Volney well denominates the *bar* at the mouth of this enormous marine river. The union of the *hot* current of water with the cold of the ocean and of the atmosphere is marked, at the bank of Newfoundland, by two phenomena. The current has expanded in width, and diminished in velocity. Hence, as in great floods, and at the mouths of rivers, the matter which had been sustained in the water during its rapid motion is now deposited, and in the course of years has formed the great bank of Newfoundland. Meanwhile, the water being relatively hot, the atmosphere which it brings with it contains copious vapors, which are precipitated, as soon as they meet with a colder current of air or water,

and form those extraordinary banks *of fog*, which are, in the atmosphere of the bank of Newfoundland, what the bank itself is to the bottom of the ocean, a continual accumulation of matter brought from a distant region, to be there deposited.

The great current still continues onward to the East, and Southeast to the Azores. At the westernmost of that group of islands it is a hundred and sixty leagues wide; and in latitude 33°, its southern edge is so near the northerly edge of the equinoctial current, running in the opposite direction, that a vessel can pass from one to the other in a day's sail. From the Azores, the current tends rather in a southerly direction, towards the Straits of Gibraltar, the Madeiras, and the Canaries. It continues to set towards the African coast, between Capes Cantin and Bodajor. In latitude 25° 26′ the current sets *South*; is afterwards turned to the *Southwest* by the trending of the coast by Cape Blanc, and soon after is again mixed with the equinoctial current; and proceeds to run again the same course.

Thus, between the parallels of 11° and 44° N. latitude, the waters of the Atlantic move in a perpetual round, as regularly as a mill-sluice: the waste being supplied by a constant influx of water from the Indian seas round the Cape of Good Hope. If a bottle were thrown into the sea it would return to the same point, unless retarded by accidental causes, in little less than three years, having completed a circuit of 3800 leagues, at the rate of rather more than ten miles a day. Such a bottle, for instance, if sent adrift at the Canary Isles, would be floated to the coast of the Caraccas in thirteen months. Ten months more would take it round the Gulf of Mexico, and opposite the port of Havannah: and about forty or fifty *days* would then be sufficient to take it from the Gulf of Florida to the bank of Newfoundland: and perhaps ten or eleven months more would bring it to the coast of Africa.

This is more than mere theory. It is not possible to trace an object during the whole round. But in the year 1770, a vessel loaded with corn, from the little island of Lancerotte to Sainte Croix, in Teneriffe, was driven to

sea with no one on board. The westerly current took it, and it was cast ashore on the American coast of Guayra, near the Caraccas.

There is still another branch of the Gulf Stream, very interesting, which causes a *northeast current* upon the coasts of Great Britain and Norway. The effect of this current, aided probably by the prevalent westerly winds, is found in the much more rapid passage of ships *from* America to England, than in the opposite direction. Besides this, plants which are natives of the West India Islands and the continent of America, have been cast ashore on the Hebrides, and northwestern coast of Scotland. The *Tilbury* was burnt some years since near Jamaica, and part of the wreck was carried by this current to the shores of Scotland.

PICTURE OF A NEW ENGLAND FAMILY.

[BY REV. JAMES FLINT.]

LET the time, be a winter evening,—the scene be the country in the midst of a storm, when the falling columns of snow are rushing impetuously from the north,—when the careering winds, let loose from the polar regions, howl mournfully abroad, and sigh through every listed door and chasm that will admit their breath;—at a time like this, and in a scene so dreary and desolate and tumultuous without, let us look into the decent dwelling of the husbandman or mechanic whose circumstances are neither above nor below the golden mean of New England competence. However gloomy the storm may rage without, the fire blazes cheerfully within. Industry, with a prudent forethought, has collected and secured her various stores, and has not been sparing of her toils. There is enough and to spare laid up to gladden the hearts of the family group with a sense of plenty and warmth within, in contrast with the cold sterility and desolation, that reign without. Indeed, all the light and genial warmth and comfort within are doubly enhanced by contrast with the cheerless and dismal aspect of things abroad. The father, whose nerves are braced with honest industry and

toil,—whose robust frame and clear eye bear unequivocal marks of temperance and inward peace—can look round, with a contented and glad heart, upon the smiling circle,—the wife of his youth, the mother of his children, engaged in useful occupation or innocent pastime,—with her children about her the while listening to the passing news from abroad, to an instructive book, or to the tale of other times, or to the narrative of the traveller, perhaps, of things and sights most marvellous and passing strange. He is sole monarch of this little blissful empire. All his subjects love him and love each other. Ambition has infused no storm into their tranquil bosoms. False pride or shame has never made them sigh for costly pleasures. Ill nature, scowling discontent, sour moroseness, spoils not a single face in the whole group. They heed not the riot and uproar of the storm abroad. All is harmonious and peaceful within. The memory of years and events that are past, is recalled by the father, and his bosom dilates with joy as he recounts, while the countenances of his children brighten with the glow of patriotic sympathy, as they listen to the history of the times that tried men's souls, of the heroic sacrifices and achievements of the asserters and defenders of our independence, of the battles they fought, the privations they endured, the virtues they displayed, that they might live and die free and leave their children to call their lands and their pleasant homes their own without a master. Behold the scene! It is the sole-surviving trace of paradise on earth, unspoiled by the perverted tastes and distempered cravings of artificial life, or the costly inventions of pride and luxury. And when, having duly invoked and thanked the Author of all their mercies, they retire to rest, it is as sweet, as tranquil and profound, as is the sleep of 'infants empty of all thought.' Who will not say, 'peace be within this house.' 'The secret of the Lord remain upon it;' and may he 'give his angels charge' to watch over it. And when its blameless and happy tenants are summoned away from this asylum of their purest joys, affections and virtues on earth, may it be to a tearless and deathless mansion in their Father's house in heaven.

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